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THE NUISANCE OF THE NEIGHBOURHOOD:

A REPRINT OF THE REPORT PRESENTED TO THE LOCAL GOVERNMENT BOARD

BY
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P R E F A C E .

THE Report, of which the following is a reprint, was made as the result of a memorial addressed to the Government, by a large number of householders and others, residing in the S.E. district.

It sets forth fully and clearly, the causes of the foul and sickening odours complained of in the memorial, and which are still the source of annoyance and discomfort, during the prevalence of northerly and north-easterly winds.

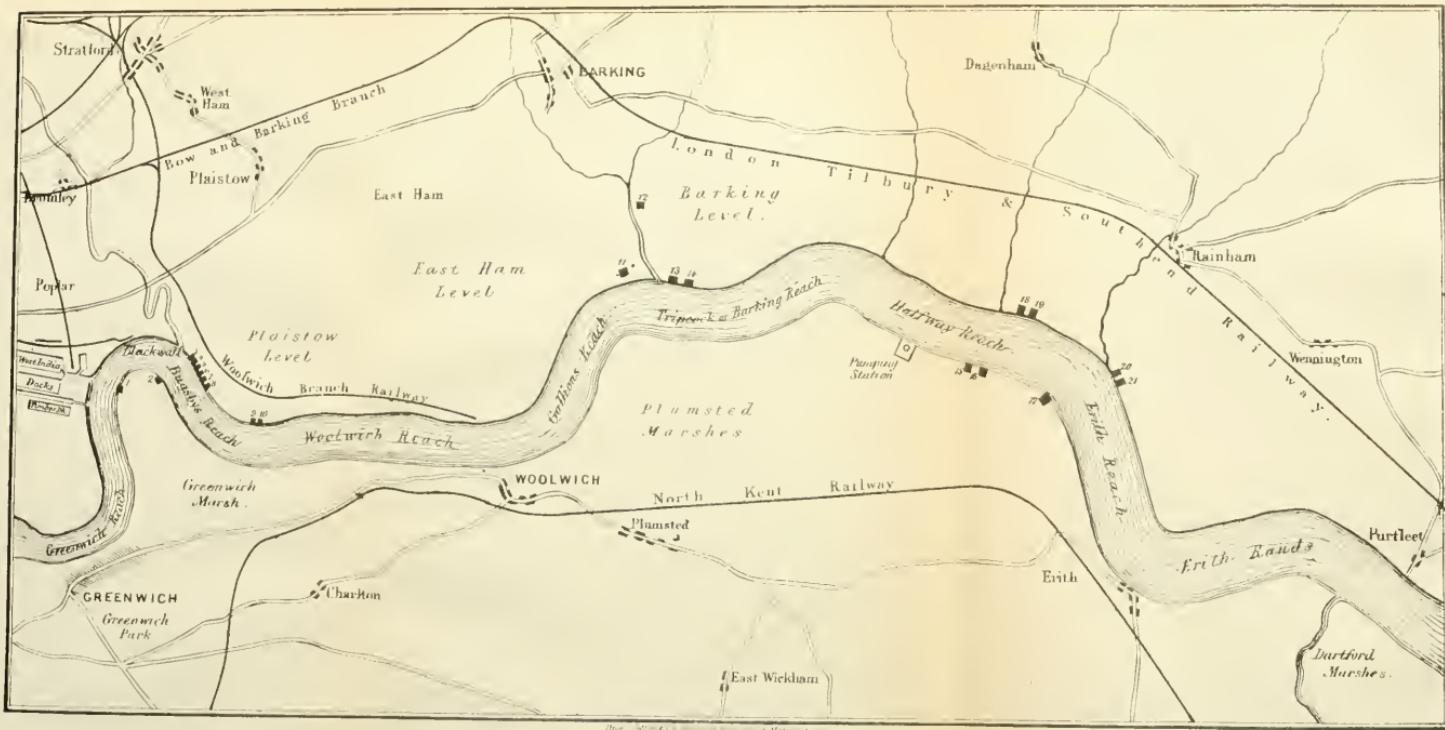
It would appear that this grievance could be readily removed, if the Chemical and Manure Works along the river side, would universally adopt proper means of consuming the gases and exhalations, that are now carried over the country for several miles.

Dr. Ballard calls upon four District Boards, to enforce the adoption of such means. Those who know anything of the working of these Boards can judge how far they are equal to a task that involves united and energetic action, and disinterested devotion to the public welfare.

Redress must be looked for from the direct interference of Government.

To obtain that interference, there is necessity, not only that public feeling should be aroused, but that strong and prompt public representations should be made on the subject. It is one of the most pressing importance. The comfort, perhaps the health, of a large community is being sacrificed, and the result can hardly fail to be, that the districts affected will lose popularity as places of residence, and that property in the neighbourhood will become seriously depreciated.

MAP TO ILLUSTRATE DR. BALLARD'S REPORT ON ALLEGED NUISANCES FROM NOXIOUS TRADES ALONG THE SHORES OF THE THAMES.



1 Moseford's Chemical Manure Works.	6 Farmer & Co Sulphuric Acid & Manure	12 Dury's Tar Works.	Bisulphide Carbon
** 2 Hills' Oil of Vitriol & Manure Works.	7 Walmley. Mott Roasting.	13 Lewis' Oil of Vitriol & Manure Works	18 Borrell & Hagan Manure (Scotch)
Mitre Castle, Tipton. Iron also.	8 Schreider & Co. Oil of Vitriol & Manure	14 Crows' Tar Works	19 Newman & Co. Candle Works
3 Gibbs & Co. oil of Vitriol & Manure.	9 Beat Boulton. Haywood Tar Works.	15 Beverington's Manure Works	20 Wilsons' Oil Vitriol & Manure
** 4 Adams D ^o D ^o	10 Woods' Oil of Vitriol.	16 Brown's Glue & Manure Works.	21 Miller & Johnson, Oil Vitriol & Manure, Works
5 Duncan's Sugar Baking.	11 Beckton Gas Works.	17 Price. Oil Works. Manufactory of	

(The asterisks indicate approximately the degree of nuisance occasioned by the several Establishments)

Report on Alleged Nuisances from Noxious Trades
carried on along the Shores of the Thames,
from Blackwall Reach to Erith Reach.

On July 25th I received instructions to make an enquiry into the effect on the health of the inhabitants across the river of the effluvia arising from certain manufactories on its north side. These effluvia had been made the subject of complaints on the part of the Sanitary Authorities of Plumstead and Woolwich, and also on the part of inhabitants of Blackheath and the neighbouring parishes of Charlton, Lee, Lewisham, and Plumstead. It appears, also, that a similar complaint had been made to the Local Board of Woolwich by the Sanitary Committee of the Woolwich garrison, and that a further complaint had been forwarded to that Board from the War Office. The complaint from the District Board of Works of Plumstead was accompanied by a joint Report from the Medical Officers of Health and the Inspectors of Nuisances of that Board, in which it is stated that the noxious effluvia complained of have caused great discomfort to the inhabitants, and, in the opinion of the reporters, are injurious to health. The Report specifically refers to the nuisance of certain chemical works and manure works, both on the north and south side of the Thames, and states that the effluvia complained of are only perceived during the prevalence of certain winds blowing from the direction of these works. It became necessary, therefore, that my enquiry should be extended to the factories on the south as well as on the north side of the river.

In the first place, I am of opinion that the complaints made by the inhabitants of Charlton and the adjoining

parishes, and by the Sanitary Committee of the Woolwich garrison, of offensive smells, are well founded. Two varieties of odour were described to me, both of which were said to be sickening, but the one more distinctly acid than the other, and the one or the other was said to be perceived according to the direction of the wind. But all parts of the district from which the complaints issued do not suffer eqnally from both varieties of odour. It appeared further, that the more elevated parts, at a greater or less distance from the shore of the river, suffer more than those parts which are situated at a lower level and nearer to the shore. The description given me by the Commandant at Woolwich, and by Dr. Gordon, the principal medical officer of the garrison, was altogether the clearest and most instructive that I had received, inasmuch as at the barracks and on the barrack field, about a mile from the river and at a considerable elevation, each variety of odour is perceptible. When the wind is in the north-west or north-north-east one variety is perceived, and when east-north-east the other variety. Dr. Gordon states that when travelling down the river from Woolwich to Purfleet he has recognised the odour of the one variety when passing the manure works of Messrs. Lawes at Barking Creek, and that of the other when passing the works of Messrs. Bevington and Messrs. Brown in Erith Marshes. The odour from the last-named works he compares to that which he has perceived in India when passing to leeward of the places in which the Hindoos consume, by an imperfect cremation, the bodies of their dead. The odour is putrid as well as sickening. A north-east wind would bring effluvia towards the barracks from Barking Creek, distant $2\frac{3}{4}$ miles, while a more easterly wind would bring those from Erith Marshes, distant $4\frac{1}{4}$ miles. In the village of Plumstead, also, there are two varieties of odour perceived, according as the wind is in the north or in the north-east ; the one wind blowing from the direction of Barking Creek, distant 2 miles, and the other from the direction of Erith Marshes, distant 3 miles.

The Manager of the Southern Outfall Pumping Station



also distinguishes two varieties of offensive odour, according as the wind is in the east, bringing effluvia which he describes as intolerably offensive, from the direction of the glue and manure works of Messrs. Brown and Messrs. Bevington, about half-a-mile lower down the river; or in the west, bringing effluvia from Barking Creek, distant about 2 miles (no factory, giving rise to offensive effluvia, intervening.) On the other hand, at Charlton, it appears, from the statements of the Inspectors of Nuisances, that only one variety of offensive odour is the subject of complaint, that it is of an acid and sickening character, and is perceived only when the wind is in the north-west, and, therefore, blowing from the direction of a group of factories on the north shore near the Victoria Docks, and from some factories on the opposite or south shore and situated in Greenwich Marshes.

It thus became necessary that I should inspect the several factories between Blackwall Reach to the west, and Erith Reach to the east. I have marked upon a map, which I append to this Report, the situation of these factories. It will be seen, on reference to the map, that they lie in three groups. Group 1 is situated on and near the shores of the river at Bugsby's reach; group 2 about Barking Creek, about 3 miles more to the east; and group 3 about $2\frac{1}{2}$ or 3 miles still further to the east, about the bend of the river between Halfway Reach and Erith Reach. The effluvia from group 1 alone appear to be complained of by the inhabitants of Charlton; the effluvia from groups 1, 2 and 3 appear to annoy the garrison at Woolwich; while those from groups 2 and 3 annoy the inhabitants of Plumstead village and of the little colony at the Southern Outfall Pumping Station. The total number of factories in the three groups is twenty-one. Group 1 consists of ten factories of various kinds, group 2 of four, and group 3 of seven factories. All of these factories are not equally offensive; some give issue to effluvia only perceptible at a short distance from the works, while the effluvia from others are such as experience has shown may be carried by the wind to the distance of several miles.

The observations made in my inspection of each group of factories were specially directed to ascertain the extent of the works, the duration of their existence, the character and amount of effluvia proceeding from them, and the means in use for preventing the escape of offensive effluvia.

Group 1 consists of the following establishments:—

(a.) On Greenwich Marshes, on the south side of the river—

(1.) *Mockford's "Ordnance" Manure Works* (No. 1 on map).—Only established about six months. No work going on at the time of my visit. There were about 250 tons of shoddy on the premises, a considerable quantity of mineral phosphates, and over 5,000 tons of guano. It was stated that the materials intended to be used are guano, mineral phosphates, and sulphate of ammonia. It was stated further that probably oil of vitriol would also be manufactured. The arrangements for preventing the escape of offensive effluvia are very imperfect, but, inasmuch as but little work has been carried on at these premises up to the present time, the effluvia proceeding from them have probably had little to do with the complaints.

(2.) *Hill's Oil of Vitriol and Manure Works* (No. 2 on map).—These works cover about three acres. They have been established here for thirty-eight years, but manures have only been manufactured here since 1856. There are separate works adjoining the manure works for the manufacture of nitric acid, tartaric acid, and oxalic acid. (a.) The arrangements for preventing escape of acid fumes in the manufacture of oil of vitriol appear to be efficient, except at times when the denitrating chamber is being washed out, which is only occasionally. (b.) The materials used in the manufacture of manures are shoddy, waste leather, dry bones, bone ash, and the refuse from sugar bakeries, coprolites, and mineral phosphates generally. Until quite lately, no means have been in use for preventing the escape of offensive effluvia into the atmosphere during the mixing of the materials, or subsequently on their discharge from the mixer. But at the time of my visit, improvements

were being made under the advice of Mr. Pink, the Medical Officer of Health for Greenwich, which will probably lead to a considerable abatement of the nuisance which these works could scarcely have failed to occasion.

(b.) On the north side of the river—

Commencing at the entrance to the docks, and extending along the shore for a distance of about a quarter of a mile, there is a row of six establishments.

(1.) *Messrs. Gibbs' Oil of Vitriol and Manure Works* (No. 3 on map).—Established here for twelve or fifteen years. (a.) The materials burned for the manufacture of oil of vitriol are crude sulphur and pyrites. The burners have not been acting well, and the escape of sulphurous acid has been made a subject of complaint to the West Ham Sanitary Authority. Under the direction of the Medical Officer of Health, Mr. Drake, alterations have been made from time to time during the last two years, and are still being made, efficiency having not yet been secured. (b.) The materials said to be used in the manufacture of manure are dry bones, guano and mineral phosphates, sulphate of ammonia being added to some kinds of manure. The best practicable means, so far as my knowledge extends, of preventing the escape of offensive effluvia into the atmosphere from the mixer and the reception-pits are in use in this establishment. Except accidentally, I should very much doubt the extension of effluvia from these works to any considerable distance.

(2.) *Odam's Oil of Vitriol and Manure Works* (No. 4 on map).—Established here in 1851. The premises cover a space of five or six acres. This is one of the largest manure establishments visited. (a.) The materials burned for the manufacture of oil of vitriol, are crude sulphur and pyrites. The burners act efficiently, but at the time of my visit the Gay Lussac condensing tower was not acting perfectly, and hence acid fumes were escaping from the shaft at an elevation of about 100 feet. But the manager stated that this was quite an accidental occurrence. (b.) The materials said to be used for manure making are shoddy,

dry blood, guano, dry bones, coprolites, and mineral phosphates generally. A very powerful pungent odour pervaded the part of the works devoted to manure making, accompanied by an empyreumatic odour, due to the heating of a heap of shoddy. From the character of the materials used, and from my experience of similar manufactories, I am satisfied that very pungent and offensive effluvia must be given off in the manufacture of manures into which these materials enter as ingredients. No means whatever are in use in this establishment to intercept these effluvia from the atmosphere, to which there are free openings at all parts of the premises.

(3) *Duncan's Sugar Bakery* (No. 5 on the map).—No suggestion was made that any offensive effluvia at any time proceeded from this establishment.

(4) *Farmer's Oil of Vitriol and Manure Works* (No. 6 on map).—Established about five years. The works are said to cover three acres, but the buildings do not appear to cover nearly this space. The works are not on a very extensive scale. (a.) Crude sulphur and pyrites are burned for the manufacture of the oil of vitriol. Some of the burners act badly, so far as the escape of sulphurous acid on opening the feeding doors is concerned. Others, which have been altered in a manner suggested by Mr. Drake, the Medical Officer of Health for West Ham, act very efficiently in this respect: otherwise this part of the works appears unexceptional. Any acid fumes which may escape condensation in the Gay Lussac tower are discharged at an elevation of 110 feet. (b.) The materials used for the manufacture of manure are said to be dry bones, coprolites, and mineral phosphates generally. Occasionally a little dried blood or sulphate of ammonia are added, but not in the mixer. Some means are in use to prevent the escape of effluvia into the premises from the mixer and receiving pit, but the object sought is to discharge them from the shaft at an elevation of 110 feet, from whence they may travel a long distance through the atmosphere. The best practicable means of preventing nuisance from the works have been adopted.

(5) *Walmsley's Malt Roasting Works* (No. 7 on map).—An empyreumatic odour is said to proceed from these works occasionally, but this is only about twice a day, when the cylinders are emptied. The effluvia has never been made a subject of complaint, and probably do not extend to any considerable distance.

(6.) *Shroeder and Company's Oil of Vitriol and Manure Works* (No. 8 on map).—These works have only quite recently been established, and indeed part of the buildings are still in course of construction. The only manure made here is prepared by the mixing of guano and oil of vitriol in an open tank. The effluvia arising from this admixture are comparatively inconsiderable, but such as they are, no means have been adopted for preventing their escape freely into the atmosphere outside the sheds. Still it is not at all probable that these works have had any part in occasioning the nuisance complained of.

The next works in the group are at the distance of half-a-mile to the eastward of those last mentioned.

(7) *Burt, Boulton, and Haywards Tar Works* (No. 9 on map).—Established here three years. The works cover a space of eleven acres. The crude material dealt with is coal tar, which, as received, contains more or less admixture with it of ammoniacal liquor. The process adopted consists at first in the fractional distillation of the tar, the distillates being subsequently dealt with for the manufacture upon the premises of anthracine, carbolic acid, benzole, &c. Much care is taken to prevent the escape of offensive effluvia by the reception of the various products of the distillation while hot into covered receptacles. The only source of offensive effluvia has been the hot pitch as first run off from the stills; but means are now being adopted to prevent nuisance from this source in future; these means are of a nature which, it appears to me are likely to be successful. It is quite possible that the vapours from the hot pitch may from time to time have reached the opposite shore of the Thames, mixed with the effluvia from manure works. But these vapours, the odour of which is peculiar

and very different from the odour proceeding from manure works, do not appear to have been distinguished by the inhabitants at Charlton.

(8.) *Wood's Oil of Vitriol Works* (No. 10 on map).—These premises have recently changed hands, and no work was being done at the time of my visit. The Inspector of Nuisances at Charlton, however, states that on one occasion he distinctly traced the pungent odour of sulphurous acid across the river to these works. It is intended shortly to manufacture manure here.

Group 2 consists of the following establishments, all on the Essex side, about Barking Creek.

(1.) *The Beckton Gas Works* (No. 11 on map).—Situated near the northern outfall sewer on the western side of the creek, not far from its mouth. They cover a space of thirty acres. The purification is effected by dry lime and by oxide of iron, and the purifiers are constructed upon the best principles. There is no reason to believe that any effluvia from these works reach the places on the south side of the river where complaints have been made.

(2.) *Davy's Tar Works* (No. 12 on map)—are situated about three-quarters of a mile from the river, on the east bank of the creek. The works cover a space of two acres, and were established here in April or May, 1872. The crude material dealt with is coal tar, which, as at Burt's works, is first subjected to fractional distillation. Crude carbolic acid and anthracene are manufactured on the premises, but other products are sent away for rectification. The arrangements for running off the pitch are as bad as they well can be, and this part of the process is a source of nuisance to the inhabitants at Barking, when the wind is in the direction to bring the vapours from the works. There is no reason, however, to believe that these vapours reach the places on the south side in any such manner as to occasion nuisance there.

(3.) *Lawes' Oil of Vitriol and Manure Works* (No. 13 on map).—Established here eighteen or nineteen years, during which time they have undergone extension from time

to time. The works cover three or four acres, and have a river frontage of continuous buildings to the extent of 200 yards. It is the largest manufactory of manure which I visited. Along the whole river front the pungent odour from the buildings was strongly marked, and the vapours proceeding from the sheds were irritating to the eyes as well as offensive to the smell. The works were everywhere pervaded within by the same odour. (a.) The materials burned for the manufacture of oil of vitriol, are crude sulphur, pyrites, and spent oxide from the gas works. So far as I was able to observe, the burners acted well. There is no Gay Lussac tower at these works, nor are any other means in use to intercept the waste gas passing from the leaden chambers. These gases are discharged into a shaft which delivers them into the external atmosphere at an elevation of 110 feet. (b.) The materials used in the manufacture of manure are said to be shoddy, a little waste leather, guano, dried bones, coprolites and mineral phosphates generally, and sulphate of ammonia. Up to the present time no proper means have been taken to prevent the escape of the irritating acid, offensive effluvia given off from the mixers, reception-pits, and accumulations of manure into the atmosphere outside the works. But recently these works have come into the hands of a Company, and the new manager is now engaged in erecting apparatus for the prevention of nuisance. I am not satisfied, however, that the means he is adopting will prove successful. These works are much complained of by the Manager of the Beckton Gas Works, who says that on Sundays they are especially offensive. These are the works which Dr. Gordon recognised as giving off the odours perceived at the barracks at Woolwich when the wind is north-east; nor have I any doubt that they are one of the sources of the nuisance complained of at Plumstead village.

(4.) *Crow's Tar Works* (No. 14 on map).—Established here as a sulphate of ammonia works for sixteen years. The tar business was formerly carried on to a less extent than it is now. The tar is (as in other tar works mentioned)

subjected to fractional distillation, and no sufficient means are in use to prevent the escape into the atmosphere of offensive vapours from the distillates and from the hot pitch. Part of the "light oil" is rectified on the premises, and anthracene is also manufactured. Otherwise all the first products are sent away from the premises in casks. It is scarcely probable, however, that these works occasion any nuisance to the inhabitants of Plumstead. In the manufacture of sulphate of ammonia from ammoniacal liquor, means are in use to prevent the escape of sulphuretted hydrogen into the atmosphere.

Group 3 consists of the following establishments:—

(a) On the south side of Erith Marshes.

(1.) *Bevington's Manure Works* (No. 15 on map).—

Situated about half-a-mile from the Southern Outfall Pumping Station. These works are small, but have been established several years. The material used is "scutch," which is the refuse matter left in the pans in which glue is made. This material is heated in closed pans by steam, with the addition of oil of vitriol, and there is an arrangement for condensing the vapours which proceed from the pans. Fat is first skimmed off, and the residue, after boiling about three hours, is run off into "delves" or trenches about four feet deep, dug into the earth outside the works: these "delves" are worked alternately. Up to about twelve months ago the pans employed were open. The manure which runs as a semi-liquid material into the "delves" solidifies in them after a time, partly by evaporation and partly by soakage of the more watery parts into the earth. When sufficiently firm the manure is dug out and dried by spreading it on heated plates, or by heating it over semi-circular brick-flues. The effluvia from these stoves or flues are very offensive indeed, and escape freely into the external atmosphere. The odour, which resembles that of cheese when very much decomposed, pervades the works and their neighbourhood.

(2) *Brown's Glue and Manure Works* (No. 16 on map) are carried on in premises adjoining Bevington's. These

works have been established a great many years, during which they have been a constant source of nuisance to persons passing up and down the river. Two manufactures are carried on here. One is that of glue from the clippings of hides used by tanners, horses' hoofs, &c. These matters arrive at the works in a more or less putrid condition, and no means whatever are in use to prevent the escape of the highly offensive vapour from the pans in which they are boiled into the atmosphere outside the works. The offensiveness of the vapour would naturally vary with the degree of decomposition of the material boiled. The "scutch" which remains after the making of the glue, is dealt with as at Bevington's Works, the only difference being that no means are in use here to condense the vapour proceeding from the pans in which the "scutch" is heated with acid. These works are the most offensive upon the river, and the putrid sickening odour from them travels for many miles. It has been distinctly recognized by the Manager of the Beckton Gas Works at his residence, a distance of three miles, and also by Dr. Gordon at the Woolwich Barracks, a distance of about four miles.

(3.) *Price's Oil Refinery Works* (No. 17 on map).—Established here nine years. The premises altogether cover ten acres, but only a portion of this space is covered by the buildings. Various oils are refined here, such as fish oil, rape oil, Rangoon oil, and American oil. The odour from these works only extends to a short distance from them. Bi-sulphide of carbon is also made here, but no offensive smell is recognizable in or about the part of the works devoted to this manufacture.

(b.) On the north side.

(4.) *Miller and Johnson's Oil of Vitriol and Manure Works* (No. 21 on map).—Established in March, 1872. They cover an extent of one-and-a-half acres. (a.) Pyrites alone used to burn as a source of sulphurous acid. The waste gases from the leaden chamber pass into a condensing apparatus supplied with steam. This is not the best method of condensation. (b.) The materials used for the

manufacture of manure, are dry blood, bones, shoddy, coprolites, and mineral phosphates generally. The mixers and receiving pits are simply ventilated by a pipe which conducts the vapours through the roof into the external air. As these works extend they will certainly become a source of nuisance, even if they are not so now, unless proper means be adopted to intercept the offensive vapours necessarily generated in the process.

(5.) *Wilson's Oil of Vitriol and Manure Works* (No. 20 on map).—Established about four years. (a.) Pyrites are used as the source of sulphur. The waste gases from the leaden chamber escape at once into the external atmosphere, no condensing apparatus whatever being in use. (b.) The materials used for manure making are fish, shoddy, guano, coprolites, and mineral phosphates generally. No means are in use to prevent the free escape of the offensive vapours generated into the external atmosphere.

(6) *Newman and Company's Candle Works* (No. 19 on map).—No work was going on at these premises at the time of my visit. I was informed by the Manager that the materials used are palm oil, tallow and bone fat. Some of these fats are distilled, and the products of the distillation condensed. A strong empyreumatic odour pervaded the works, but I have no means of knowing how far it would travel.

(7.) *Borell and Hagan's Manure Works* (No. 18 on map.)—Adjoins the works last mentioned. There was no one on the premises at the time of my visit, but from what I observed it was evident that "scutch" manure was made, and that no means were in use to prevent the escape of offensive effluvia.

To sum up the inferences I draw from the observation made during my inspection of the above works, I may say that—

(1.) It is tolerably certain that the offensive effluvia complained of by the inhabitants of Charlton and its vicinity, have proceeded from the works upon Greenwich Marshes, and from the other manure works in group 1.

Perhaps at various times, or occasionally, other effluvia from other works than the manure works, have assisted to create the nuisance complained of. Probably also the principal sources of nuisance have been Hill's Works on Greenwich Marshes and Odam's Works on the opposite side of the river.

(2.) It is tolerably certain that the effluvia complained of as proceeding from the direction of Barking Creek, have issued mainly from the manure works of Messrs. Lawes.

(3.) It is absolutely certain that the putrid sickening odour proceeding from the direction of group 3 has issued mainly from the glue and manure works of Messrs. Brown and Messrs. Bevington on Erith Marshes. Perhaps, from time to time, other effluvia have been added from the manure works on the opposite shore of the river.

With respect to the influence exerted upon the health of the persons who have been exposed to these offensive effluvia, and who complain of them as nuisances, little can be said of a very definite nature. Neither Dr. Finch nor Dr. Wise, both of whom stated it as their opinion that the effluvia were injurious to health, could furnish me with any specific information upon this subject. I am aware of no evidence that the workmen employed in artificial manure works suffer in any way from disease referable to the nature of their occupation. Nevertheless, delicate persons, and even some healthy persons, are very susceptible to the influence of sickening odours, such as those given off from the works complained of. Such persons are "upset" by them, made sick or nauseated, and, to such an extent as this, may be said to have their health disturbed. Dr. Gordon stated to me in conversation that, in the event of any severe epidemic occurring, evil would, in his opinion, probably result from these nuisances, on the principle that anything which "upsets" the nervous system predisposes an individual to suffer. This is, perhaps, as much as can be said upon the subject, except that it may be added that, during the prevalence of the winds which carry foul odours with them, householders prefer to keep their doors and

windows closed at the cost of insufficient ventilation of their dwellings.

The Local Sanitary Authority in Greenwich Marshes is the District Board of Works of Greenwich ; which appears to have been taking proper steps to cause the abatement of the nuisances arising from the works upon the Marshes.

The Sanitary Authority on the opposite side of the river, where the other works in group 1 are situated, is the Local Board of West Ham, which should be called upon to exercise its functions in respect of the trade nuisances pointed out in this Report. It has dealt with some of them more or less satisfactorily but not with all.

The Sanitary Authority on Barking Creek is the Rural Sanitary Authority of Romford Union, which also, I believe, has jurisdiction over the trade nuisances of group 3 on the northern shore of the river. At present this Authority has taken no steps to cause the abatement of the nuisances arising from factories.

The Sanitary Authority in Erith Marshes is the Rural Sanitary Authority of Dartford Union. This Authority should be called upon to proceed without delay to cause the abatement of the intolerable nuisances proceeding from the works of Messrs. Brown and Bevington.

EDWARD BALLARD.

*Medical Department of the Local Government Board,
December 8, 1873.*

